(vegetables, legumes, wholegrains). A one SD increase in the scores on the high protein/fruit pattern was associated with decreased likelihood of preterm birth (adjusted OR 0.31; 95%CI: 0.13, 0.72; $p = 0.007$); whereas the high fat/sugar/take-away pattern was associated with increased risk for preterm birth (adjusted OR 1.54; 95%CI: 1.10, 2.15; $p = 0.011$), and was also associated with shorter gestation ($p = 0.001$) and birth length ($p = 0.004$).
Conclusions A dietary pattern containing protein-rich food sources, fruit, and some wholegrains, is associated with reduced risk for preterm delivery, whereas a dietary pattern mainly consisting of discretionary items is associated with preterm delivery, shorter birth length and earlier gestation. Poor dietary behaviours in the periconceptional period could be altered to promote behaviour change in dietary intake to improve perinatal outcomes and the long-term health of the child.
Funding source(s): NHMRC.

GESTATIONAL DIABETES IN MARES DURING LATE PREGNANCY

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Background/Aims: In pregnancy partitioning of nutrients from maternal tissues to the foeto-placental unit ensures normal development of the foetus and is associated with decreased insulin sensitivity. Such changes can be influenced by diet and body condition. This study examined insulin and glucose responses in pregnant mares with disparate body condition
Methods: Mares were given either a high (HE: $n = 6$) or low energy (LE: $n = 7$) diet for the last trimester of pregnancy. Body condition score (BCS) was assessed and a frequently sampled intravenous glucose tolerance test was performed on day 320 of gestation. This permitted determination of insulin sensitivity (Si), glucose effectiveness (Sg), acute insulin response to glucose (AIRg), and disposition index (DI).
Results: The BCS in HE fed mares were significantly ($p < 0.001$) higher than LE fed mares. Insulin sensitivity, AIRg and DI were significantly ($p < 0.01$) lower in LE mares. In contrast, glucose effectiveness was not different.
Conclusions: Overall the results indicate that LE fed mares became insulin resistant in late pregnancy and exhibit diminished β cell responsiveness; features characteristic of human GDM. This is the first report of equine GDM. These novel results highlight the importance of BCS in metabolic responses during pregnancy.
Funding source(s): Rural Industries Research and Development Corporation.

CHANGES IN ADDED SUGAR INTAKE AND ITS MAJOR FOOD SOURCES IN OLDER AUSTRALIANS DURING A 15—YEAR FOLLOW-UP

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Background/Aims: The aim of this study was to assess the changes in added sugar (AS) intake and its food sources during 15 years of follow-up in a cohort of older Australians.
Methods: Dietary data were collected from the participants of the Blue Mountains Eye Study (BMES), aged ≥ 49 years, using a 145-item Food Frequency Questionnaire (FFQ). AS content of FFQ items was determined using recipes, food labels and other estimation methods. Eight hundred and sixty four participants who provided usable FFQs at both baseline (1992-1994) and follow-up (2007-2009) were considered for the analysis. Paired t-tests were used to assess the changes in intake between baseline and follow-up.
Results: Mean (SD) intake of AS and percentage of energy from AS (%EAS) were 47.1 (32.3) g and 9.0% at baseline and 46.3 (28.4) g and 8.8% at follow-up, respectively. There were no significant changes in mean intake, energy adjusted mean intake or %EAS during follow-up ($p > 0.05$). The major sources of AS intake at both time points were sugar products and dishes (sugar, honey, jam and syrup) (baseline: 21.3 g, follow-up: 19.5 g), followed by confectionery (lollies and chocolate) (baseline: 7.1 g, follow-up 7.9 g). During follow-up, the contribution of sugar products and dishes to AS intake decreased by 3.2% ($p = 0.008$), while the contribution of confectionery increased by 2.2% ($p < 0.001$).
Conclusions: Older Australians of this cohort did not decrease their AS consumption during 15 years of follow-up but their intake from food sources of AS changed.
Funding source(s): NHMRC.

PG-SGA: THE USE OF A NUTRITION ASSESSMENT TOOL FOR TRIAGE IN AN INTERDISCIPLINARY CANCER CACHEXIA CLINIC

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Background/Aims: Cancer cachexia is a wasting condition affecting 50% of cancer patients, associated with decreased response to anti-neoplastic therapy, quality of life, and survival. The study aimed to establish if the nutritional status of patients on referral, as determined by 'Patient Generated Subjective Global Assessment' (PG-SGA) could be used to identify high-risk patients attending an interdisciplinary cachexia clinic.
Methods: A retrospective study was completed for non-active patients that attended the Barwon Health clinic between January 2008 and December 2013 ($n = 142$). Patients with baseline PG-SGA scores were stratified to SGA-A: well nourished, SGA-B: suspected or moderately malnourished, or SGA-C: severely malnourished. Comparison of survival curves was carried out using the Log-rank (Mantel-Cox) test.
Results: Forty three patients (25%) survived beyond study duration. Overall median survival was 136 days from first clinical appearance. Those patients within the SGA-C range had significantly shorter median survival interval (61 days) from their first clinical appearance compared to SGA-A (280 days, $p = 0.001$) or SGA-B (183 days, $p = 0.001$). The median survival from final clinical appearance was 71 days. SGA-C patients had significantly shorter median survival interval (42 days) from their final clinical appearance compared to patients in the SGA-A (158 days, $p = 0.001$) or SGA-B range (80 days, $p = 0.01$).
Conclusions: Given ease of administration, and significant survival distinction, PG-SGA may be a useful triaging tool to identify patients in need of immediate intervention. Increasing the frequency that the questionnaire is administered would also assist in tracking the progress, and identifying patients in decline.
Funding source(s): Victorian Cancer Agency.

THE EFFECT OF A PROTEIN-ENRICHED DIET COMBINED WITH PROGRESSIVE RESISTANCE TRAINING ON QUALITY OF LIFE IN ELDERLY WOMEN

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Background/Aims: To determine the effect of a protein-enriched diet, combined with progressive resistance training (PRT), on quality of life in elderly women.
Methods: In a 4-month cluster randomised controlled trial, 100 women aged 60-90 years from 15 retirement villages participated in PRT twice a week and received either ~160 g/d (cooked) lean red meat (consumed 6 days/week; RT+Meat) or >1 serving/day carbohydrate (RT+C). Quality of life was determined by the SF-36 questionnaire at baseline and 4 months.
Results: Ninety-one women (mean ± SD age 73.1 ± 6.8 years) completed the study [RT+Meat ($n = 48$) and RT+C ($n = 43$)]. Mean ± SD protein intake was greater in RT+Meat than RT+C throughout the study (1.3 ± 0.3 vs. 1.1 ± 0.3 g/kg/d, $p < 0.05$). Exercise compliance was not different between groups, with a mean attendance for both groups of 74%. There were no significant multivariate effects for group ($p > 0.05$) or time × group ($p > 0.05$), but a significant effect for time ($p = 0.044$) Within-group analysis

indicated that bodily pain significantly worsened in both groups, with a significant interaction for physical functioning, role physical, bodily pain and physical component ($p < 0.05$ for all). Further analyses revealed greater improvements in physical functioning, role physical and physical component in the RT+meat vs. RT+C group ($p < 0.05$).
Conclusions: Combining progressive resistance training with a protein-enriched diet led to improved measures of physical quality of life in elderly women, whereas there were no improvements in resistance training alone.
Funding source(s): Meat and Livestock Australia.

THE INFLUENCE OF AGE ON THE BMI AND ALL-CAUSE MORTALITY ASSOCIATION: A META-ANALYSIS

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Background/Aims: A healthy body weight range for adults is defined as a BMI (kg/m^2) between 18.5 and 24.9, however, our meta-analysis for those $\geq$ 65 years, indicated a greater risk of mortality at a BMI < 23. Our aim was to clarify if there is a clear age-related difference in the BMI mortality association in cohort studies spanning the whole adult age range.
Methods: A sub-group analysis of studies included in our meta-analysis spanning the whole adult age range. We included studies of community-living adults that included cohorts both $\geq$ and < 65 years. The reference BMI value used was 23.5 kg/m^2. Two-stage random-effects meta-analysis was used to examine a potential nonlinear relation between BMI and all-cause mortality risk.
Results: Seven studies were identified including a total of 254,954 subjects < 65 years with 17,633 deaths and 54,221 subjects $\geq$ 65 years with 9,652 deaths. Mortality risk tended to fall at BMIs lower than 23 in the younger group and increased in the older group e.g. BMI range 20.0-20.9: < 65 years: HR 0.94 (95%CI: 0.85, 1.05); $\geq$ 65 years: HR 1.16 (1.07, 1.25). In the younger group mortality increased from BMI range 28.0-28.9, HR 1.16 (1.00, 1.35) but mortality did not tend to increase in the older group until a BMI 35.0-35.9, HR 1.03 (0.81, 1.33).
Conclusions: Age significantly alters the BMI mortality association and this effect is evident in cohort studies that span the whole adult age range, confirming that the recommendation for optimal BMI for older adults is different from that of younger adults.
Funding source(s): N/A.

DIET DURING PREGNANCY AND FOETAL GROWTH AND BODY COMPOSITION IN WOMEN AT RISK OF GESTATIONAL DIABETES MELLITUS

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Background/Aims: To explore the effect of maternal nutrition on foetal growth in a self-selected sub-group of women who participated in a randomized controlled trial comparing the effect of a low glycaemic index (low-GI) diet vs a healthy diet (HD) in women at risk of GDM ($n = 139$).
Methods: Fifty nine women (mean ± SD age 35.2 ± 3.8 years, pre-pregnancy BMI: 25.8 ± 5 kg/m^2) joined the sub-study. Dietary data were collected using 3-day food records. Differences between groups were tested using ANCOVA. Linear regression was used to assess the general effects of maternal diet ($n = 96$) on offspring body composition, assessed by air-displacement plethysmography.
Results: Dietary GI was significantly different between groups (low-GI 51 ± 1 vs. HD 57 ± 1, $p < 0.001$). Birth weight *z*-score was lower in the low-GI (0.17 ± 0.15) compared to the HD group (0.65 ± 0.16, $p = 0.037$), as was birth length *z*-score (low-GI 0.25 ± 0.17 vs. 0.85 ± 0.15, $p = 0.016$). Maternal carbohydrate intake (%E) in early pregnancy was inversely related to offspring fat free mass (FFM) index ($\beta = -0.196$, $p = 0.050$, $n = = 96$). Fat and saturated-fat were positively associated with offspring FFM index (% fat, $\beta = 0.241$, $p = 0.016$; %saturated-fat, $\beta = 0.250$, $p = 0.012$, $n = 96$). In late pregnancy, carbohydrate was inversely associated with offspring fat mass (FM) index, while fat and saturated-fat was positively associated with offspring FM index (%carbohydrate, $\beta = -0.243$, $p = 0.037$; %fat, $\beta = 0.224$, $p = 0.037$; %saturated-fat, $\beta = 0.216$, $p = 0.036$, $n = 88$). Higher GI was associated with lower FFM index ($\beta = -0.267$, $p = 0.013$).
Conclusions: Maternal diet and GI influence foetal growth and body composition.
Funding source(s): NHMRC

TIME TRENDS IN PLASMA CHOLESTEROL AND TRIACYLGLYCEROL FROM 1991 TO 2013 IN TERTIARY STUDENTS

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Background/Aims: Monitoring time trends in blood lipids in young adults are informative of lifestyle changes because use of cholesterol-lowering medication in this age group is uncommon. The aim of this study was to examine the time trends in plasma cholesterol and TAG concentrations in young adults.
Methods: Participants in this cross-sectional survey were students enrolled in undergraduate nutrition papers at the University of Otago sometime between 1991 and 2013. Blood was collected from volunteers after they had fasted overnight for 10 h or more. Plasma total cholesterol and TAG concentrations were measured using Roche diagnostic kits on automated Cobas instruments. Univariate and multiple linear regression were used to examine time trends in plasma lipid concentrations.
Results: There were 2027 plasma cholesterol and 1990 plasma TAG measurements included in the unadjusted analysis. Plasma total cholesterol concentration decreased by 0.18 mmol/L every 10 years ($p < 0.001$; 95%CI: -0.24, -0.11) and plasma TAG concentration decreased by 8.3% every 10 years ($p < 0.001$; 95%CI: -11.2, -5.3). Further adjustment for sex, age and BMI in the regression model increased the reduction in total cholesterol and TAG concentration to 0.27 mmol/L ($p = 0.029$; 95%CI: -0.50, -0.03) and 12.0% ($p < 0.012$; 95%CI: -20.3, -2.7) per 10 years increment, respectively.
Conclusions: Plasma cholesterol and triacylglycerol concentrations in Otago tertiary students enrolled in nutrition have declined since 1991, probably from dietary changes. These time trends may differ slightly from those in the general population.
Funding source: University of Otago.

DOES INCREASED DAIRY PROTEIN INTAKE IMPROVE STRENGTH AND LEAN MASS IN OLDER ADULTS?

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Background/Aims: It is important to maintain muscle mass and strength into older age to maintain health. The aim was to evaluate whether consuming dairy protein immediately after exercise stimulates greater increases in strength in older adults compared with soy protein or a lower protein control diet.
Methods: Healthy older adults ($n = 179$, mean ± SD age 61.5 ± 7.4 years, BMI 27.6 ± 3.6 kg/m^2, 81 males and 98 females) were randomised to one of three 12-week isocaloric dietary treatments designed to maintain energy balance: high dairy protein (HP-D, delivering > 1.2 g/kg body weight of protein per day; ~27 g dairy protein); high soy protein (HP-S, delivering >1.2 g/kg body weight of protein per day; ~27 g soy protein); typical protein intake (TP, delivering < 1.2 g/kg body weight of protein per day). All participants undertook the same progressive resistance exercise training program three times per week. Muscle strength and body composition were assessed at Week 0 and 12 and treatments effects were analysed using two-way ANOVA.